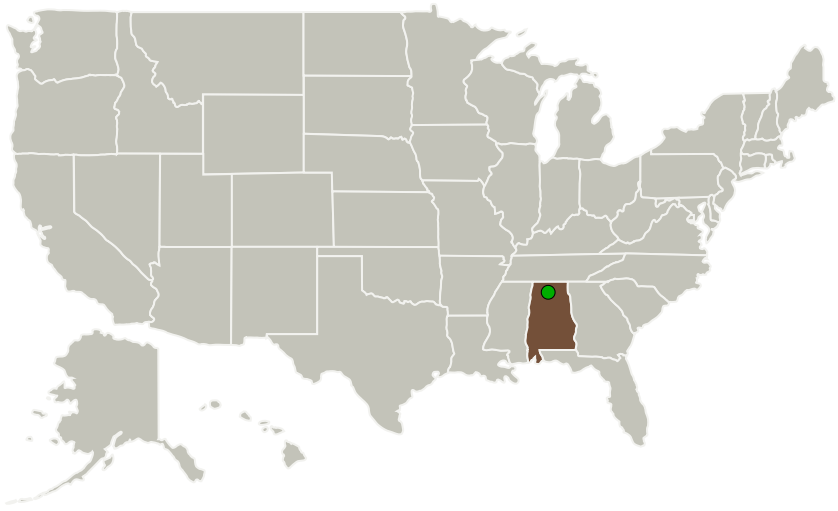
Mass Production of Mature Lunar Regolith Simulant, Phase I

Completed Technology Project (2010 - 2010)

Project Introduction

As NASA prepares for future exploration activities on the Moon, there is a growing need to develop higher fidelity lunar soil simulants that can accurately reproduce the properties and behavior of lunar soil. Simulants are employed on earth to verify the performance of equipment, mechanisms, structures and processes to be used on the lunar surface. One of the significant limitations of current simulants is the lack of constituents, such as agglutinates and spherules, which often contain nano-phase iron (Fe0). These constituents are needed in any high fidelity simulant. Recently, Plasma Processes, Inc. (PPI) has developed a process to create simulated agglutinates and volcanic glasses from JSC-1A lunar regolith simulant. Microstructural characterization has shown that these components contain an appreciable amount of nano phase Fe0. However, current production of these simulant additives is limited. The ultimate objective of this Phase I effort is to develop an economical, large scale manufacturing process to produce simulant agglutinates and volcanic glasses. This production process promises to be a viable route for significantly enhancing the fidelity of existing and future lunar regolith simulants.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Marshall Space Flight Center(MSFC)	Supporting Organization	NASA Center	Huntsville, Alabama

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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Primary U.S. Work Locations
Alabama

Project Transitions

January 2010: Project Start

July 2010: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/139202)*

Project Management

Program Director:

Jason L Kessler

Program Manager:

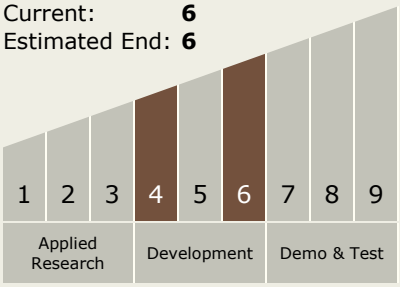
Carlos Torrez

Principal Investigator:

Daniel Butts

Technology Maturity (TRL)

Start: **4**
Current: **6**
Estimated End: **6**



Technology Areas

Primary:

- TX07 Exploration Destination Systems
  - TX07.2 Mission Infrastructure, Sustainability, and Supportability
    - TX07.2.3 Surface Construction and Assembly

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Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System